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**WATER SUPPLY OUTLOOK
FOR
MONTANA**

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,
and
MONTANA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with Federal, State, and private organizations listed on the inside back cover of this report.

AS OF
MAR. 1, 1967

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season as they affect runoff will add to be an effective average. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data or reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

Listed below are water supply outlook reports based on Federal-State-Private Cooperative snow surveys. Those published by the Soil Conservation Service may be obtained from Soil Conservation Service, Room 507, Federal Building, 701 N. W. Glisan, Portland, Oregon 97209.

PUBLISHED BY SOIL CONSERVATION SERVICE

D. A. WILLIAMS, Administrator

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 507, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85205
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80202
Idaho	P. O. Box 38, Boise, Idaho 83701
Montana	P. O. Box 855, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4001 Federal Building, Salt Lake City, Utah 84111
Washington	840 Bon Marche Bldg., Spokane, Washington 99206
Wyoming	P. O. Box 340, Casper, Wyoming 82602

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



WATER SUPPLY OUTLOOK
FEDERAL-STATE-PRIVATE COOPERATIVE SNOW SURVEYS

For
MONTANA

Report Prepared

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MONTANA WATER SUPPLY OUTLOOK
March 1, 1967

* * * * *
*
* Above average snow accumulation in the high eleva- *
* tions, near average in the low elevations, and *
* denser than normal snow pack, will all combine to *
* provide generally above average streamflow for the *
* April through September period and near to above *
* average late season irrigation water supplies. *
*
* * * * *

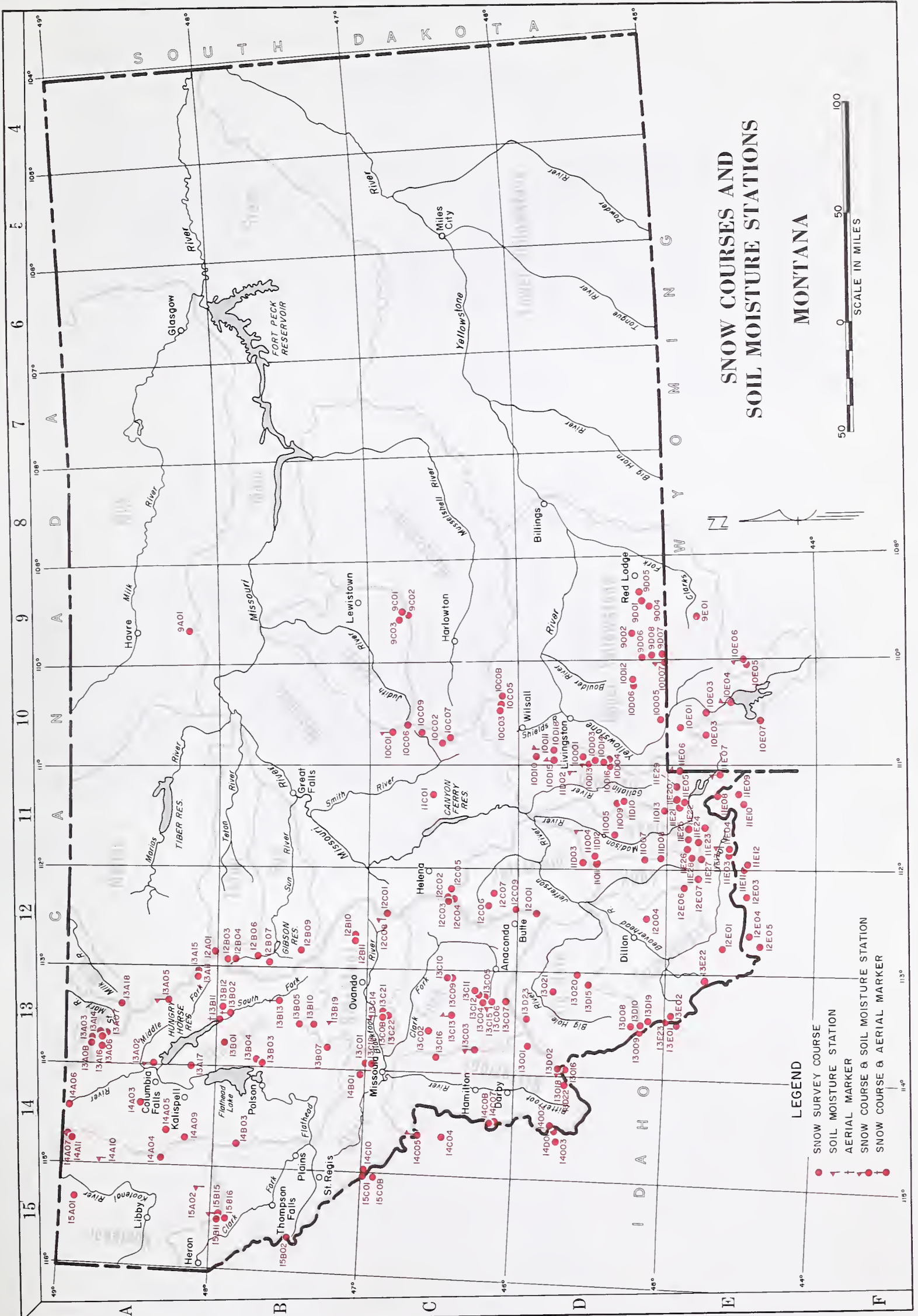
West of the Divide, high elevation snow pack in the Mission and
Whiterish ranges in Montana, and into the headwaters of the Kootenai, have
a record snow pack. Near record snow accumulation was recorded in high
elevations of the Flathead drainage. The median elevations in the
Kootenai and Flathead have above average snow pack, while low elevations
are near to below average. The Bitterroot and Clark Fork drainages have
near average snow pack. In these drainages the high elevation accumulation
is above average, while low elevations are near or a little below average.
The snow pack is extremely dense for this time of the season.

East of the Divide, snow pack is heavy in the higher elevations, de-
creases to above average in the median elevations, and is generally near
average in the lower elevations. The snow pack in the high elevations of
the Sun and Teton River drainages is third highest to maximum of record,
fourth highest of record in the Gallatin drainages, and portions of the
Absaroka-Beartooth ranges, and near or above the highs recorded in 1965
along the top of the Little Belt, Big Belt and Castle mountains. Snow
pack in all other drainages is presently above average.

In the Columbia River drainage, seasonal streamflow volume is forecast to be second highest on record on the main stem of the Kootenai River as it enters Montana from British Columbia. Runoff from streams tributary to the Kootenai in Montana are forecast above average but not near the record flow. This less than record inflow will reduce flow on down the main stem. Runoff at Leona is forecast as the fifth highest on record. April through September streamflow on the Flathead drainages is forecast third to fifth highest on record. The Swan River is forecast second highest on record. The Blackfoot River is forecast above average, while the Upper Clark Fork and Bitterroot drainages should produce near to a little above average seasonal runoff. The Clark Fork below the Flathead is forecast 10 to 15 percent above average.

Streamflow east of the Divide is forecast 20 to 30 percent above average for the Red Rock, Gallatin, Sun River and St. Mary drainages, and for streams whose headwaters originate in the Little Belt Mountains and in the Absaroka and Beartooth mountains. The Big Hole and Ruby drainages are forecast a little above average, while the remainder of the drainages east of the divide are forecast from 10 to 20 percent above average.

Late season irrigation supplies are expected to be above average.



SNOW COURSES AND
SOIL MOISTURE STATIONS

MONTANA



LEGEND

- SNOW SURVEY COURSE
- + SOIL MOISTURE STATION
- +⊥ AERIAL MARKER
- +⊥ SNOW COURSE & SOIL MOISTURE STATION

INDEX to MONTANA SNOW COURSES and SOIL MOISTURE STATIONS

SNOW COURSES

[illegible]

SOIL MOISTURE STATIONS

Number	Elev.	Sec.	Twp.	Range	Record Began	Measuring Dates 1/	Mens. By 2/	Drainage Basin & Course Name	Number	Elev.	Sec.	Twp.	Range	Record Began	Measuring Dates 1/	Mens. By 2/
COLUMBIA RIVER BASIN																
RUBY RIVER																
								Clover Meadow	11D08	8600	28	9S	2W	1963	3,4,5	1
								Divide	12E06	7900	14	12S	4W	1963	3,4,5	1
								Notch		8500	18	11S	4W	1963	3,4,5	1
BIG HOLE RIVER																
	5900	36	26N	31W	1966	3,4,5,5,6	2	Abundance Lake	13D20	8800	7	3S	11W	1963	3,4,5	1
15B11	4600	31	26N	30W	1965	3,4,5,5,6	2	Darkhorse Lake	13D19	8600	4	8S	16W	1963	3,4,5	1
15B16	5000	5	25N	30W	1965	3,4,5,5,6	2	Poohoon	13D21	8280	11	1S	13W	1968	3,4,5	1
15A15	5000	12	36N	29W	1966	3,4,5,5,6	1,2	Janneke Creek	13D08	7340	25	7S	16W	1968	3,4,5	1
15A01	4200	4	36N	29W	1937	3,4,5,5,6	1,2	Fallsade Creek	13D23	8450	3	2W	15W	1967	3,4,5	1
15A07	5450	20	37N	24W	1937	3,4,5,5,6	1,2									
JEFFERSON RIVER																
								Berry Meadow	12E07	7300	8	5N	5W	1962	3,4,5	1
12E03	5150	11	24N	25W	1961	3,4,5	1,5	Copper Mountain	12D09	7700	23	3N	6W	1966	2,3,4,5	4
13A11	5900	31	28N	11W	1964	3,4,5	2	Picnic Grounds	12D06	6500	21	5N	7W	1941	2,3,4,5	4
13B03	6750	7	28N	18W	1961	3,4,5	6	Pipestone Pass	12D01	7200	10	1N	7W	1938	1,2,3,4,5	1
MADISON RIVER																
13A17	6400	30	28N	18W	1962	3,4,5	6									
13A02	5600	24	31N	19W	1937	1,2,3,4,5,6	1,2									
13B04	5900	8	22N	18W	1962	3,4,5,6	1,5									
13B04	5900	8	22N	18W	1962	3,4,5,6	1,5									
12A09	5150	11	28S	25W	1960	3,4,5	1,5	Gall Road	11D07	8950	21	8S	2W	1962	3,4,5	1
13B12	6300	35	28N	14W	1964	3,4,5	2	Four Mile	11D12	6900	5	4S	2W	1965	3,4,5	2
12A03	5770	35	28N	22W	1964	1,2,3,4,5,5,6	2	Freezeout Lake	11E25	7200	6	12S	1E	1965	3,4,5,5,6	2
13B13	5300	18	31N	13W	1964	1,2,3,4,5	1,2	Freezeout Mountain	11E26	8250	26	11S	1W	1965	3,4,5,5,6	2
13A05	5300	34	30N	22W	1964	3,4,5	6	Hagen Dam	11E05	6950	22	11S	3E	1934	1,2,3,4,5	3
13A05	4300	34	30N	24W	1937	3,4,5	1,2	Black Creek	11E25	6100	23	11S	1E	1965	3,4,5,5,6	2
13A05	5250	34	30N	14W	1934	3,4,5	6	Lisa Mountain	11E26	6700	23	11S	2W	1967	Continuously	2
13A16	4200	29	35N	17W	1957	3,4,5	3	Lower Twin	11D11	7900	12	4S	3W	1965	Continuously	2
13B07	6330	3	17N	17W	1941	3,4,5,5,6	1,5	Meridian Creek	11E23	7000	31	12S	1E	1965	3,4,5,5,6	2
13B02	7000	23	25N	15W	1948	1,2,3,4,5,6	1	North Meadow	11D03	7500	24	3S	3W	1961	3,4,5,5,6	2
13B01	6100	9	25N	17W	1948	3,4,5	1	Potomacgton Park	11E21	7150	33	10S	3E	1965	3,4,5	2
13B11	3580	24	26N	16W	1951	1,2,3,4,5	1	Sentinel Creek	11E20	8300	17	10S	3E	1965	3,4,5	2
13B05	7000	28	20N	15W	1948	3,4,5	1	Teepee Creek	11E24	8000	6	12S	1W	1965	3,4,5,5,6	2
								Upper West Fork	11E27	8750	6	12S	2W	1966	3,4,5,5,6	2
								West Yellowstone	11E07	6700	34	13S	5E	1934	Continuously	1,3,6
MISSOURI RIVER BASIN																
BITTERROOT RIVER																
								Gibbons Pass	13D18W	7100	4	2S	19W	1962	Monthly	1
								Lolo Pass	12C05N	5250	11	10N	24W	1963	Monthly	1
CLARK FORK RIVER																
								Black Pine	13C13W	7100	26	8N	15W	1965	Monthly	1
								Georgetown Lake	13C15W	6450	6	5W	13W	1962	Monthly	1
								Lubrecht Forest	13C14W	4700	11	13W	15W	1961	Monthly	8
								Seelye Lake	13B19W	4030	21	17N	15W	1963	Monthly	2
								Skalkaho Summit	13C03M	7260	30	6N	17W	1964	Monthly	1
KOOTENAI RIVER																
								Baree Trail	15B13M	3800	5	25N	30W	1964	Monthly	2
								Murphy Lake R.S.	14A10M	3000	5	34N	25W	1964	Monthly	2
								Raven R.S.	15A02N	3050	2	26N	29W	1964	Monthly	2
FLEATHED RIVER																
								Dawert Mountain	13A02M	5600	24	31W	10W	1956	Monthly	1
								Marías Pass	13A05W	5250	34	30N	14W	1950	Monthly	1
CLARK FORK RIVER																
								Black Pine	13C13W	7100	26	8N	15W	1965	Monthly	1
								Georgetown Lake	13C15W	6450	6	5W	13W	1962	Monthly	1
								Lubrecht Forest	13C14W	4700	11	13W	15W	1961	Monthly	8
								Seelye Lake	13B19W	4030	21	17N	15W	1963	Monthly	2
								Skalkaho Summit	13C03M	7260	30	6N	17W	1964	Monthly	1

MISSOURI RIVER BASIN

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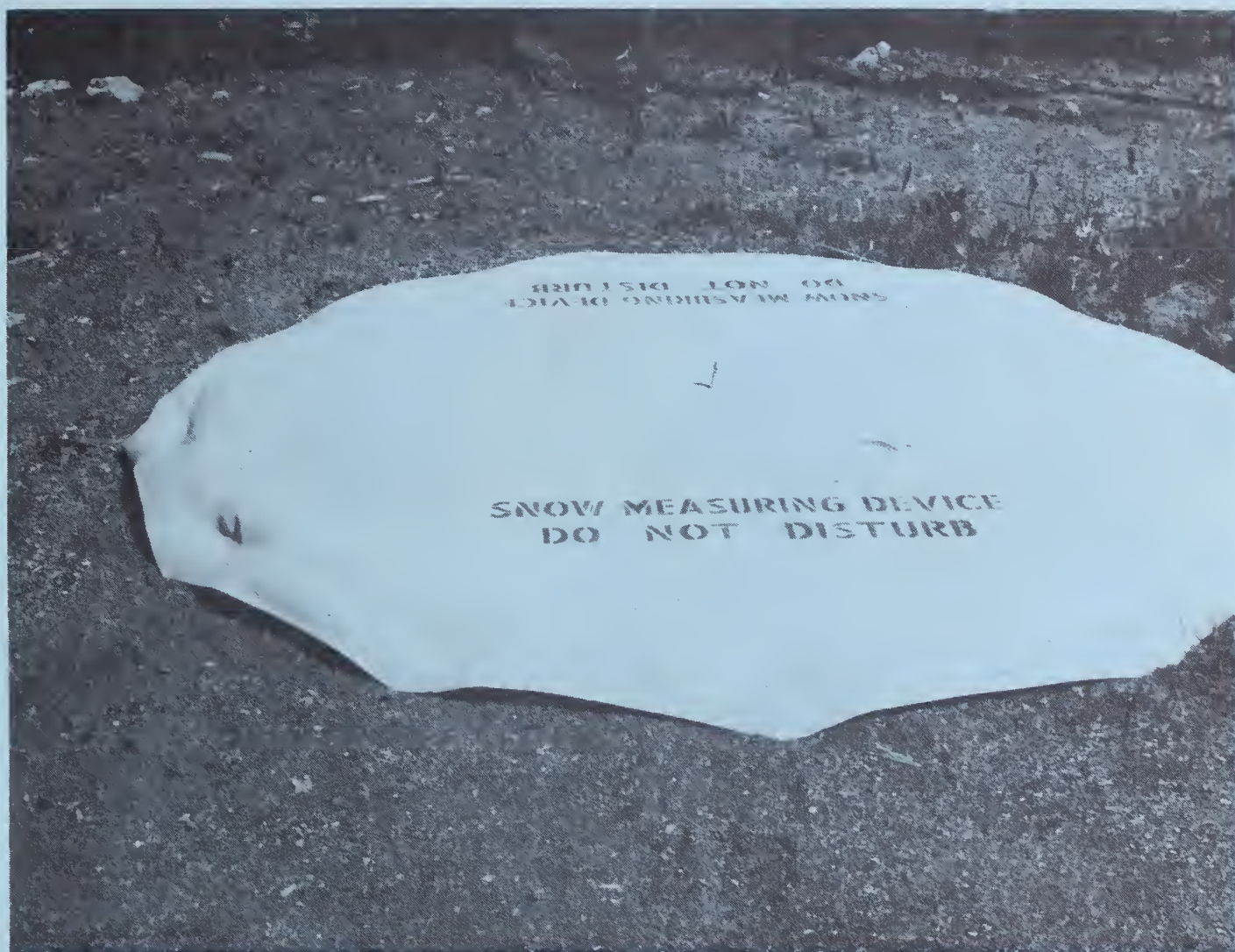
LEGEND

1/ Numerals 1, 2, 3, 4, 5, 5¹/₂, 6 refer to January 1, February 1, March 1, April 1, May 1, May 15 and June 1.

2/ Numerals refer to Agency that secures the snow survey as follows:

1. U. S. Soil Conservation Service
2. U. S. Forest Service
3. U. S. Geological Survey
4. Montana Power Company
5. U. S. Indian Service
6. U. S. National Park Service
7. MSP Agricultural Experiment Station
8. U. of M. School of Forestry
9. Dominion Water & Power Bureau
10. U. S. Bureau of Sport Fisheries & Wildlife

THE SNOW PILLOW



Snow Pillow installation at Lick Creek, Montana

During the past few years the Soil Conservation Service has tested snow measuring devices for obtaining a continuous record of snow accumulation and melt. The most versatile and promising is the nylon reinforced butyl or neoprene snow pillow, which is usually about 12 feet in diameter and filled with a methanol alcohol-water solution to a depth of three inches. The pillow is placed on a level ground surface. A hose connects the pillow to a manometer or pressure transducer in an instrument shelter. As snow falls on the pillow the amount of fluid rise in the manometer is equivalent to the water content in the snow pack. A water level recorder installed in the manometer provides a continuous record of the snow water content. Telemetered (transmitted by radio signal) information is obtained by connecting a pressure transducer to the pillow. The signal from the transducer is converted to equivalent inches of water content at the receiving station. Air temperature, total precipitation, soil moisture and soil temperature can be telemetered, in addition to snow water content.



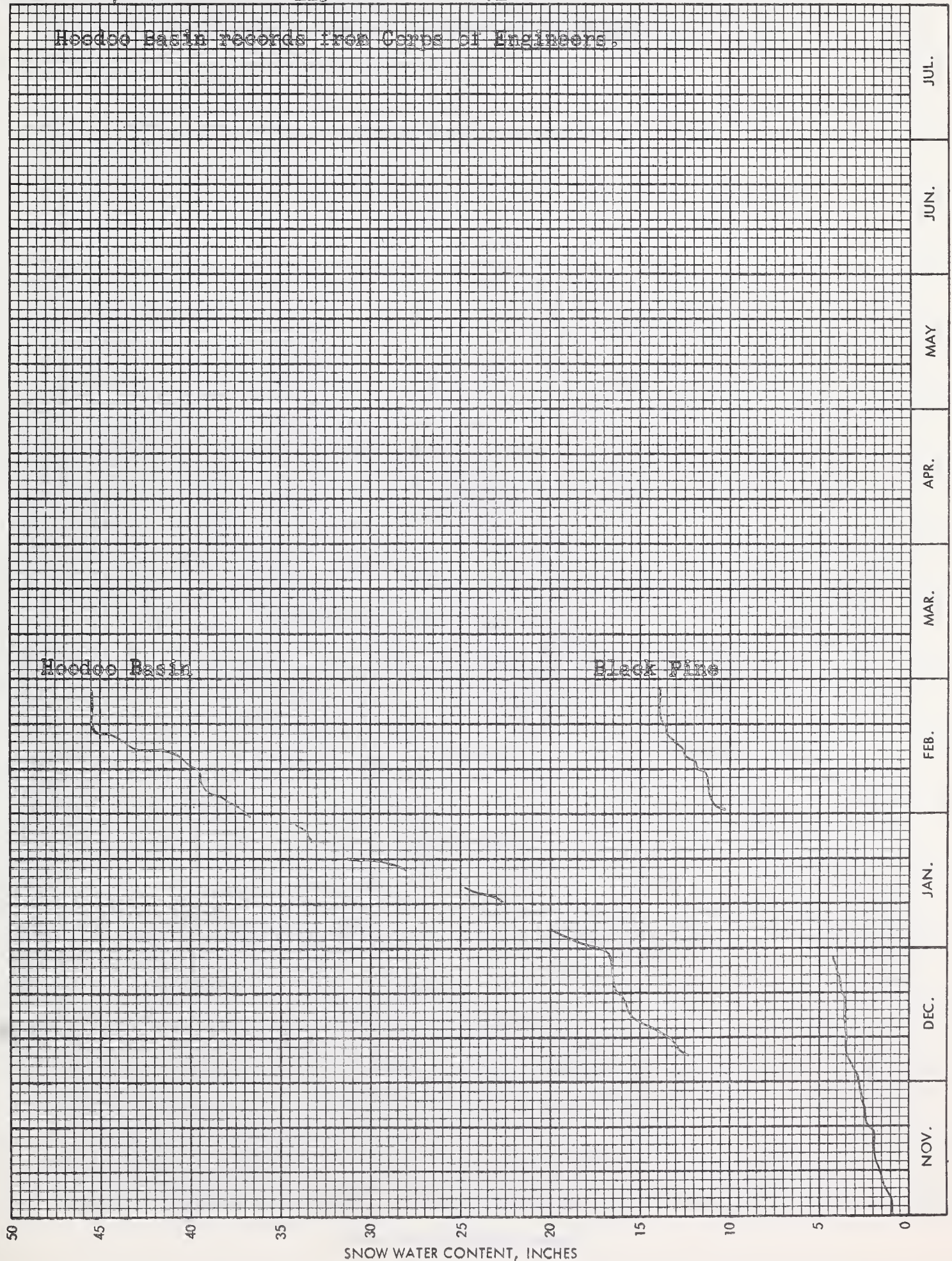
THE RIVER VALLEY, N. W. INDIA

The photograph shows a wide river valley, with the river flowing through the center. The banks are covered with dense vegetation, and there are some small structures visible in the distance. The overall scene is a typical representation of a river valley in North-West India.

HOODOO BASIN & BLACK PINE SNOW PILLOW DATA

AS OF MARCH 1, 1967

Hoodoo Basin	-	Sec.	<u>17</u>	T.	<u>14N</u>	R.	<u>27W</u>	No.	<u>15C08</u>	Drainage:	<u>Clark Fork</u>
Black Pine	-		<u>26</u>		<u>8N</u>		<u>15W</u>		<u>13C13</u>		
Hoodoo Basin	-	Lot.	<u>46-59</u>			Long.	<u>115-02</u>	Elev.	<u>6000</u>		
Black Pine	-		<u>46-26</u>				<u>113-26</u>		<u>7100</u>		



SNOW WATER CONTENT, INCHES

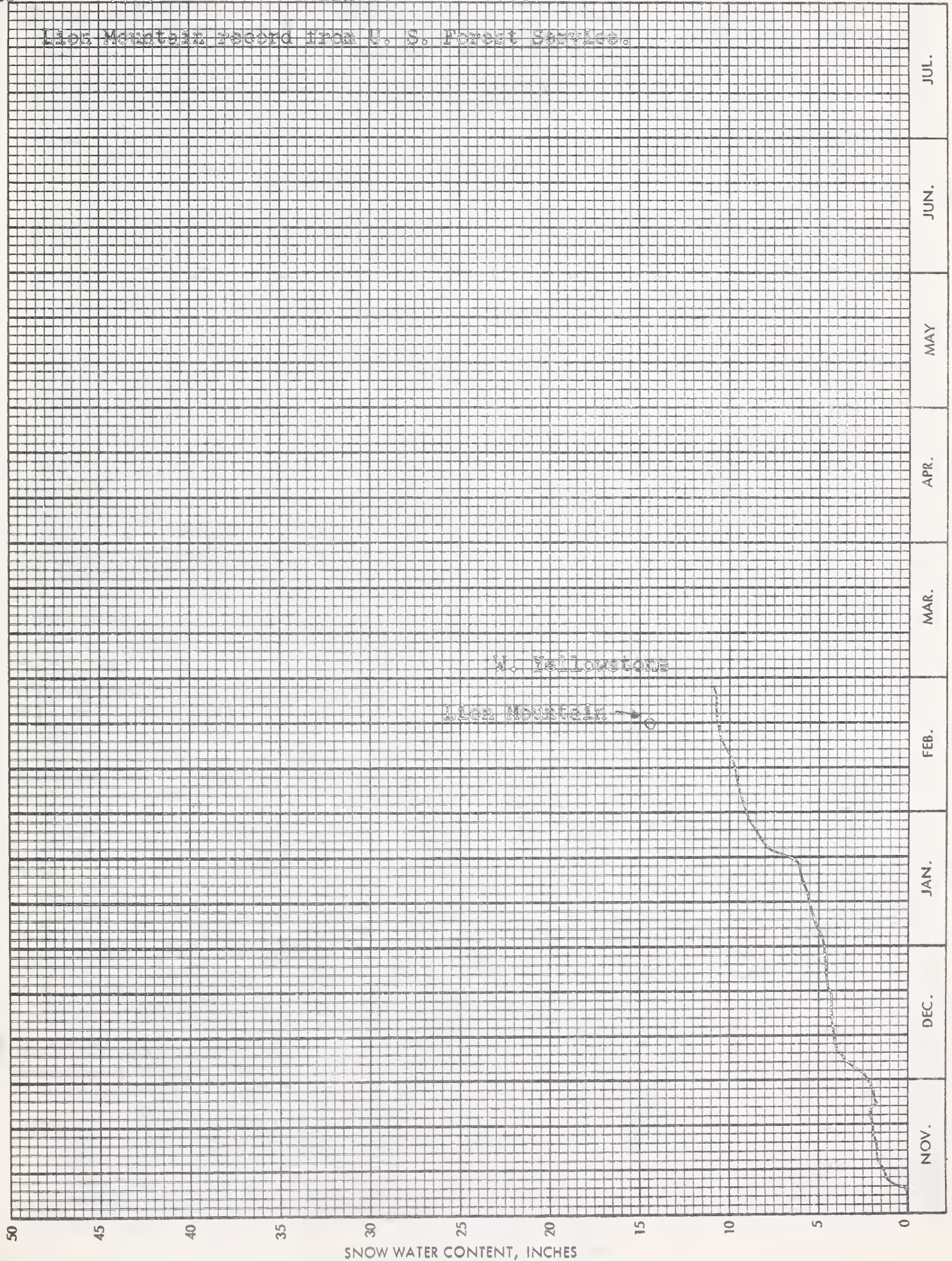


LION MOUNTAIN & W. YELLOWSTONE SNOW PILLOW DATA

AS OF MARCH 1, 1967

Lion Mountain	-	Sec.	<u>23</u>	T.	<u>11S</u>	R.	<u>2W</u>	No.	<u>11E28</u>	Drainage:	<u>Madison</u>
W. Yellowstone	-		<u>34</u>		<u>13S</u>		<u>3E</u>		<u>11E07</u>		
Lion Mountain	-	Lat.	<u>44-52</u>			Long.	<u>111-48</u>	Elev.	<u>8760</u>		
W. Yellowstone	-		<u>44-40</u>				<u>111-06</u>		<u>6700</u>		

Lion Mountain record from U. S. Forest Service.



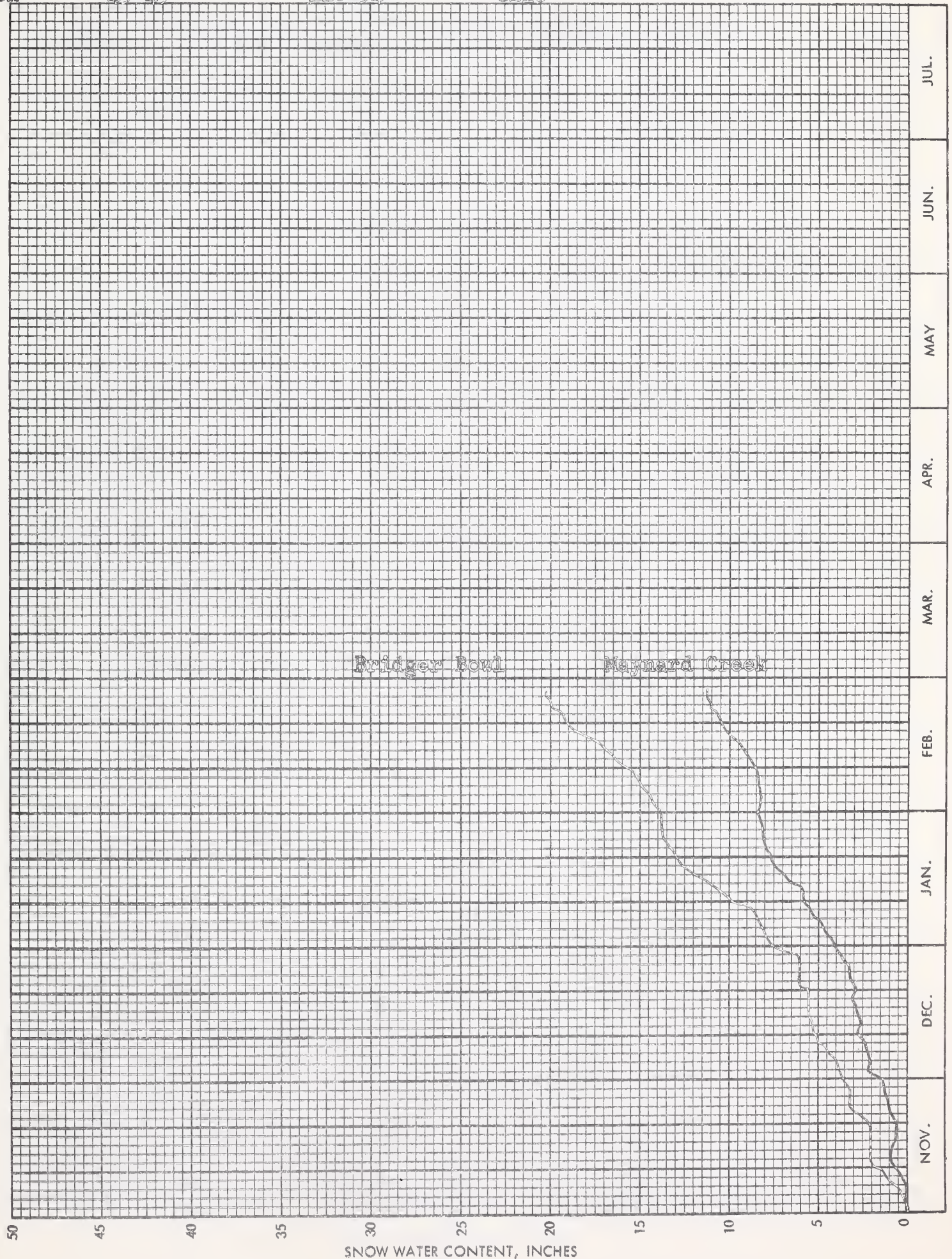
SNOW WATER CONTENT, INCHES



BRIDGER BOWL & MAYNARD CREEK SNOW PILLOW DATA

AS OF MARCH 1, 1967

Bridger Bowl	-	Sec.	25	T.	1N	R.	6E	No.	10D15	Drainage:	Gallatin
Maynard Creek	-		19		1N		7E		10D18		
Bridger Bowl	-	Lat.	45-48			Long.	110-55	Elev.	7250		
Maynard Creek	-		45-49				110-54		6210		



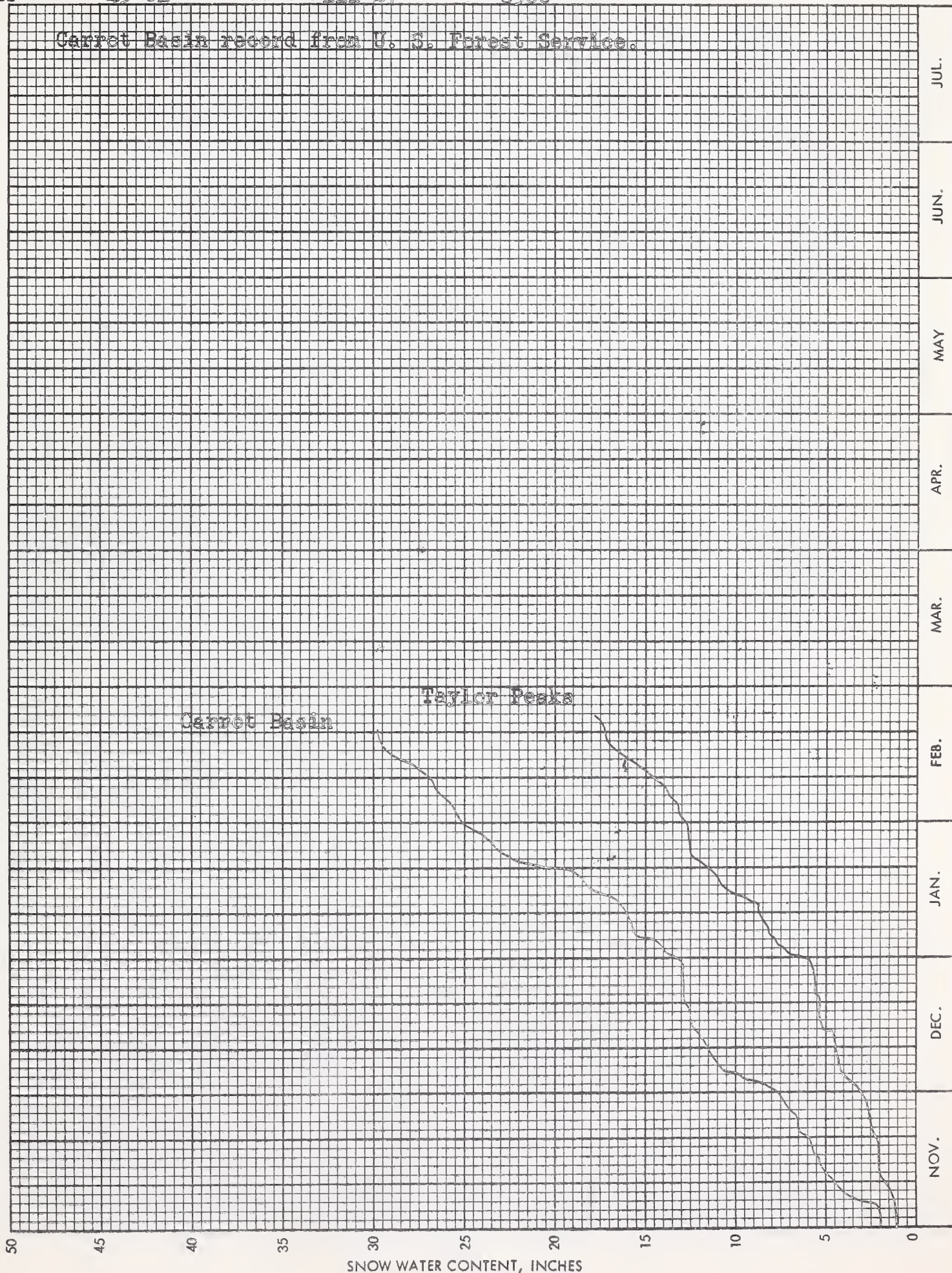


CARROT BASIN & TAYLOR PEAKS SNOW PILLOW DATA

AS OF MARCH 1, 1967

Carrot Basin	Sec. <u>18</u>	T. <u>10S</u>	R. <u>4E</u>	No. <u>11E29</u>	Drainage: <u>Gallatin</u>
Taylor Peaks	<u>26</u>	<u>9S</u>	<u>2E</u>	<u>11D13</u>	
Carrot Basin	Lat. <u>44-58</u>		Long. <u>111-58</u>	Elev. <u>9000</u>	
Taylor Peaks	<u>45-01</u>		<u>111-27</u>	<u>8500</u>	

Carrot Basin record from U. S. Forest Service.



SNOW WATER CONTENT, INCHES

THE HISTORY OF THE
CITY OF BOSTON
FROM 1630 TO 1800

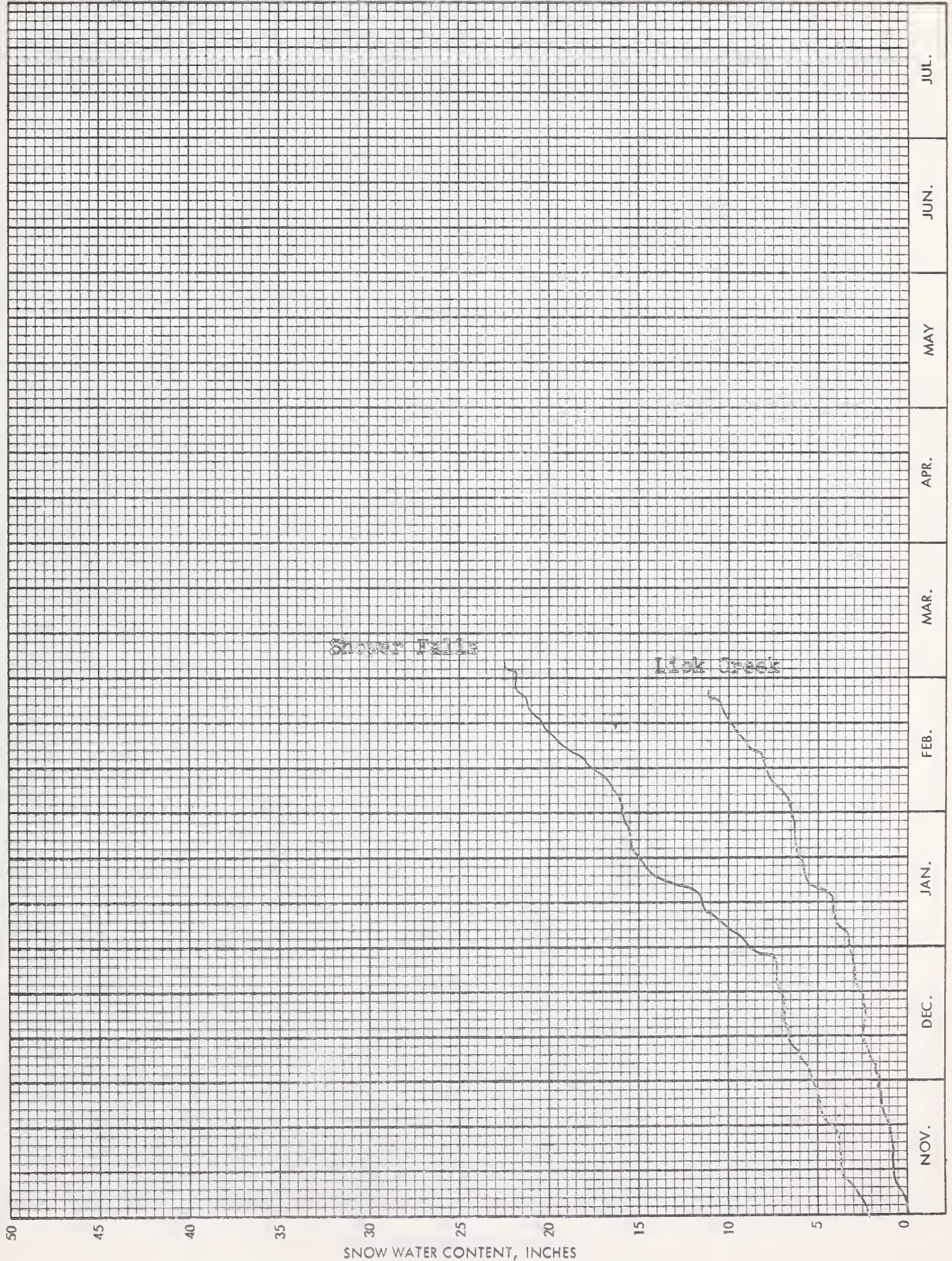
By JOHN B. HENNING, Esq.
of the City of Boston.



LICK CREEK & SHOWER FALLS SNOW PILLOW DATA

AS OF MARCH 1, 1967

Lick Creek	-	Sec.	<u>10</u>	T.	<u>4S</u>	R.	<u>6E</u>	No.	<u>10D13</u>	Drainage:	<u>Gallatin</u>
Shower Falls	-		<u>14</u>		<u>5S</u>		<u>6E</u>		<u>10D16</u>		
Lick Creek	-	Lat.	<u>45-30</u>			Long.	<u>110-58</u>	Elev.	<u>6860</u>		
Shower Falls	-		<u>45-24</u>				<u>110-57</u>		<u>8100</u>		

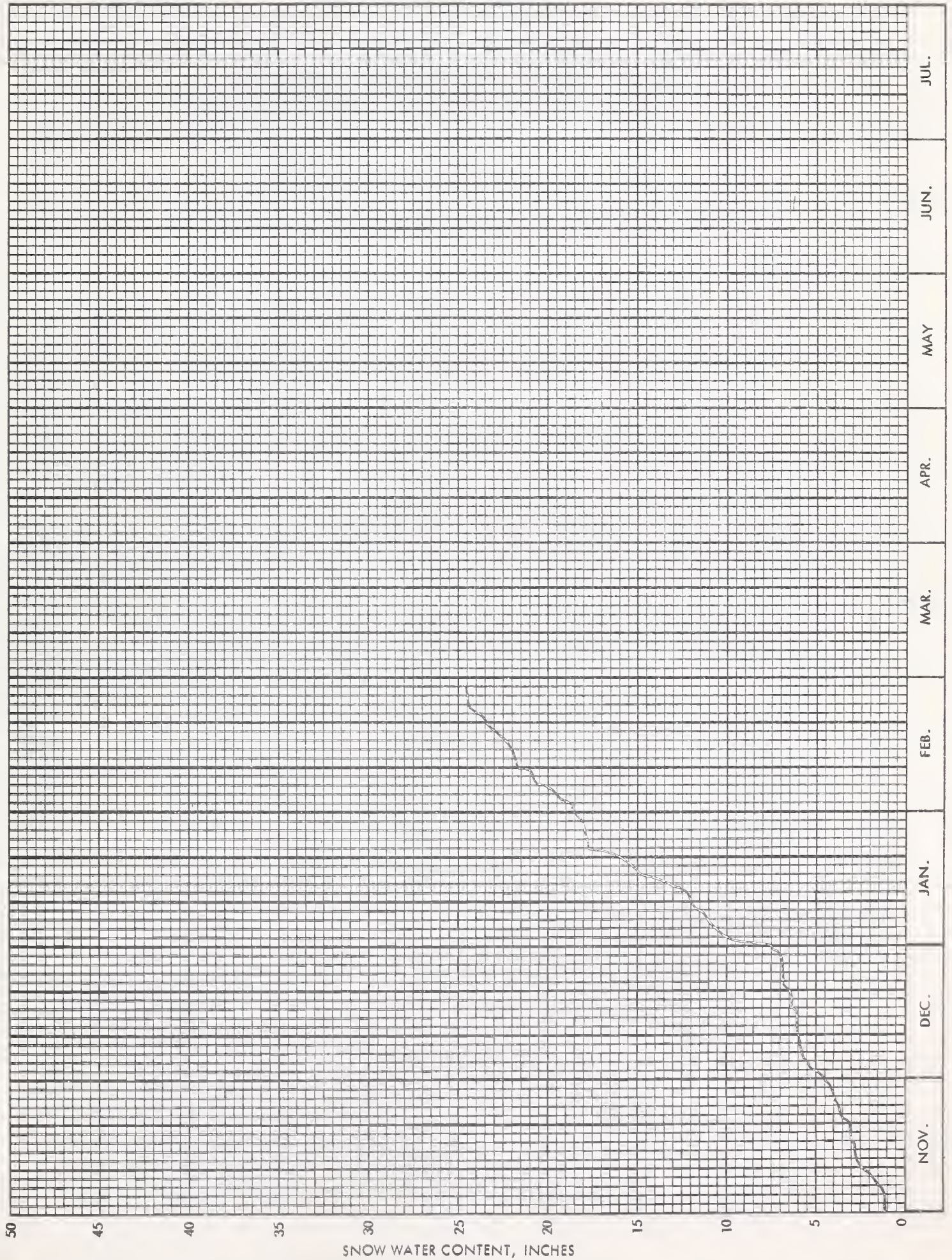




SPUR PARK
SNOW PILLOW DATA

AS OF MARCH 1, 1967

Sec. 20 T. 12N R. 9E No. 10006 Drainage: Judith
Lat. 46-47 Long. 110-37 Elev. 8000

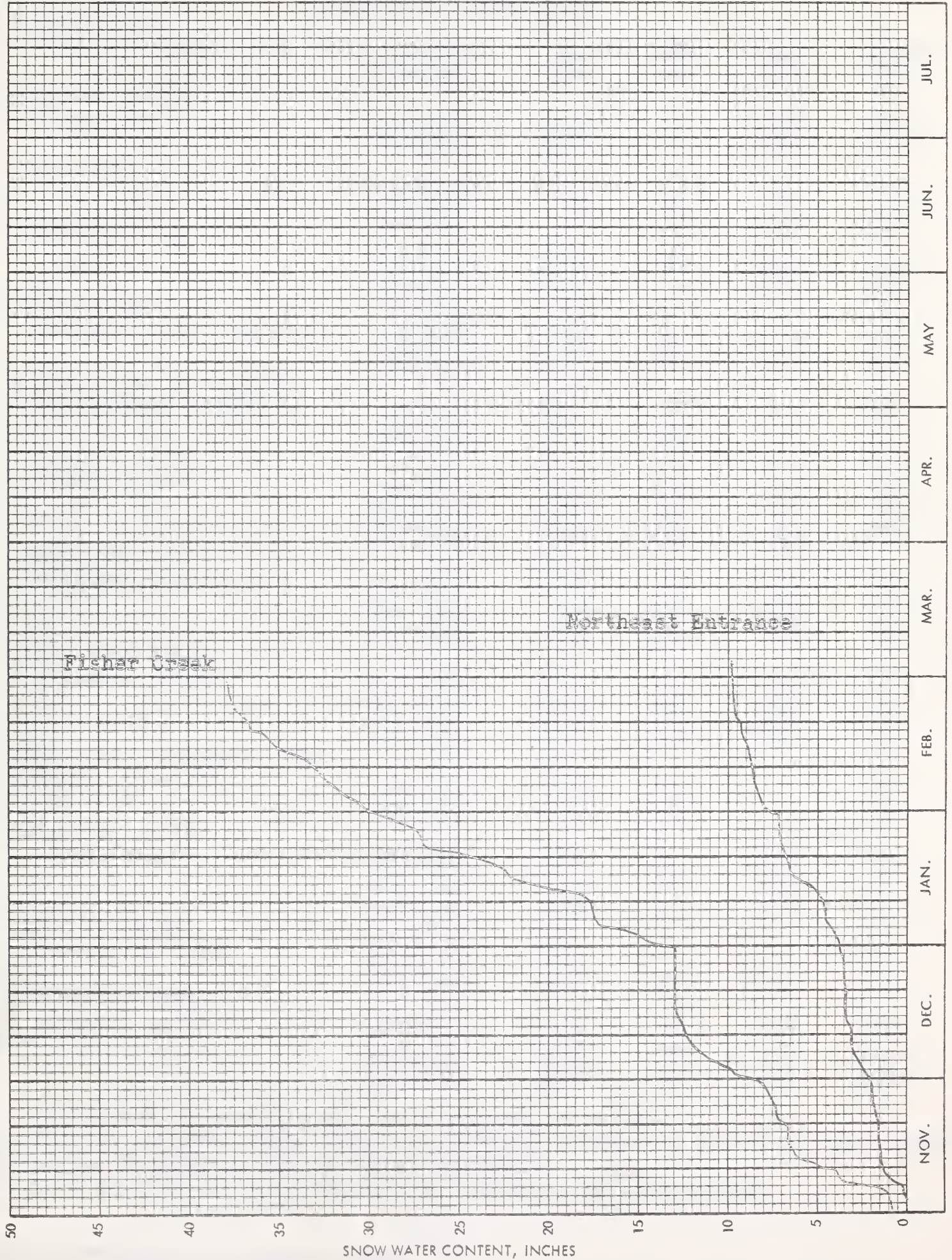


SNOW WATER CONTENT, INCHES

FISHER CREEK & N.E. ENTRANCE SNOW PILLOW DATA

AS OF MARCH 1, 1967

Fisher Creek	-	Sec.	<u>11</u>	T.	<u>9S</u>	R.	<u>14E</u>	No.	<u>9D06</u>	Drainage:	<u>Yellowstone</u>
N.E. Entrance	-		<u>33</u>		<u>9S</u>		<u>14E</u>		<u>10D07</u>		
Fisher Creek	-	Lat.	<u>45-04</u>			Long.	<u>109-57</u>	Elev.	<u>9100</u>		
N.E. Entrance	-		<u>45-00</u>				<u>110-00</u>		<u>7400</u>		



SNOW WATER CONTENT, INCHES

11 14 17 20 23 26 29 32 35 38 41 44 47 50

THE HISTORY OF THE

REIGN OF

CHARLES THE FIRST



BY

WATER SUPPLY FORECASTS

AS OF MARCH 1, 1967

		(1000 Acre Feet)				
NO.	RIVER AND FORECAST POINT	FORECAST	FORECAST	PERCENT	MEASURED FLOW	
		PERIOD	THIS YEAR	AVERAGE	LAST YEAR*	AVERAGE
COLUMBIA RIVER BASIN						
	FISHER RIVER					
3020	Jennings (near)	Apr-Sept	345	108	247	318
		Apr-July	326	108	234	302
	KOOTENAI RIVER					
3030	Libby (at)	Apr-Sept	9820	121	7929	8096
		Apr-July	8500	121	6998	7010
	YAAK RIVER					
3045	Troy (near)	Apr-Sept	640	115	564	555
		Apr-July	612	115	549	532
	KOOTENAI RIVER					
3050	Leonia (at)	Apr-Sept	11020	118	9176	9327
		Apr-July	9650	118	8156	8179
	FLINT CREEK					
3301	Boulder Creek (below)(3)	Apr-Sept	75.8	104	47.3	73.0
		Apr-July	61.4	104	35.8	59.1
	MIDDLE FORK ROCK CREEK					
3320	Philipsburg (near)	Apr-Sept	85.0	109		77.8
		Apr-July	76.8	109		70.5
	BLACKFOOT RIVER					
3400	Bonner (near)	Apr-Sept	1170	113	717	1036
		Apr-July	1060	113	646	938
		Apr-June	920	113	569	812
	CLARK FORK RIVER					
3404	Milltown (above)(4)	Apr-Sept	820	102	483	802
		Apr-July	720	102	412	705
		Apr-June	618	102	356	605
	CLARK FORK RIVER					
3405	Missoula (above)	Apr-Sept	1990	108	1203	1838
		Apr-July	1780	108	1064	1642
		Apr-June	1538	108	931	1417
	WEST FORK BITTERROOT RIVER					
3425	Conner (near)(5)	Apr-Sept	190	106		179
		Apr-July	178	106		168
	BITTERROOT RIVER					
3440	Darby (near)	Apr-Sept	595	102	273	582
		Apr-July	555	102	240	542
		Apr-June	488	102	216	478
	BLODGETT CREEK					
3475	Corvallis (near)	Apr-Sept	44.5	100	30.2	44.6
		Apr-July	42.5	100	29.2	42.6
	BITTERROOT RIVER					
3528	Missoula (at)(6)	Apr-Sept	1522	98	813	1553
		Apr-July	1415	98	750	1446
		Apr-June	1225	98	677	1253

(3) Sum, Flint Creek at Maxville and Boulder Creek at Maxville.

(4) Difference in observed flow, Clark Fork above Missoula and Blackfoot near Bonner.

(5) Adjusted for storage in Painted Rocks Reservoir.

(6) Difference in observed flow, Clark Fork above and below Missoula.

WATER SUPPLY FORECASTS

AS OF MARCH 1, 1967

(1000 Acre Feet)

NO.	RIVER AND FORECAST POINT	FORECAST PERIOD	FORECAST THIS YEAR	PERCENT AVERAGE	MEASURED FLOW	
					LAST YEAR*	AVERAGE
3530	CLARK FORK RIVER Missoula (below)	Apr-Sept	3512	103	2016	3391
		Apr-July	3195	103	1814	3088
		Apr-June	2763	103	1608	2670
3545	CLARK FORK RIVER St. Regis (at)	Apr-Sept	4670	101	2919	4642
		Apr-July	4260	101	2635	4230
		Apr-June	3700	101	2336	3671
3555	NORTH FORK FLATHEAD RIVER Columbia Falls (near)	Apr-Sept	2550	125	1878	2027
		Apr-July	2310	125	1709	1844
		Apr-June	1960	125	1452	1565
3585	MIDDLE FORK FLATHEAD RIVER West Glacier (near)	Apr-Sept	2300	120	1755	1923
		Apr-July	2130	120	1633	1785
		Apr-June	1820	120	1404	1521
3625	SOUTH FORK FLATHEAD RIVER Columbia Falls (near)(7)	Apr-Sept	2850	120	2004	2381
		Apr-July	2710	120	1910	2262
		Apr-June	2380	120	1708	1988
3630	FLATHEAD RIVER Columbia Falls (at)(7)	Apr-Sept	7900	122	5670	6497
		Apr-July	7360	122	5284	6028
		Apr-June	6320	122	4601	5185
3700	SWAN RIVER Big Fork (near)	Apr-Sept	850	122	594	694
		Apr-July	750	122	526	614
		Apr-June	615	122	430	503
3720	FLATHEAD RIVER Polson (near)(8)	Apr-Sept	9400	121	6841	7778
		Apr-July	8680	121	6399	7229
		Apr-June	7500	121	5519	6188
3890	CLARK FORK RIVER Plains (near)(8)	Apr-Sept	14470	113	9968	12793
		Apr-July	13270	113	9175	11736
		Apr-June	11400	113	7942	10077
3895	THOMPSON RIVER Thompson Falls (near)	Apr-Sept	315	104	212	302
		Apr-July	284	104	186	273
3907	PROSPECT CREEK Thompson Falls (at)	Apr-Sept	172	104	124	165
		Apr-July	162	104	115	155
3920	CLARK FORK RIVER Whitehorse Rapids (at)(9)	Apr-Sept	16170	112	11474	14398
		Apr-July	14800	112	10516	13187
		Apr-June	12700	112	9089	11318

(7) Adjusted for storage in Hungry Horse Reservoir.

(8) Adjusted for storage in Hungry Horse Reservoir and Flathead Lake.

(9) Adjusted for storage in Hungry Horse, Flathead Lake and Noxon Rapids Reservoirs.

WATER SUPPLY FORECASTS

AS OF MARCH 1, 1967

		(1000 Acre Feet)				
NO.	RIVER AND FORECAST POINT	FORECAST	FORECAST	PERCENT	MEASURED FLOW	
		PERIOD	THIS YEAR	AVERAGE	LAST YEAR*	AVERAGE
MISSOURI RIVER BASIN						
0110	RED ROCK RIVER Kennedy Ranch (at)	Apr-Sept	89.5	125	50.2	71.7
		Apr-July	82.5	125	47.6	66.2
0125	RED ROCK RIVER Monida (near)(11)	Apr-Sept	94.0	120	55.1	78.4
		Apr-July	88.5	120	53.6	73.7
0195	RUBY RIVER Alder (near)	Apr-Sept	82.0	103	60.6	79.6
		Apr-July	68.4	103	51.4	66.4
0255	BIG HOLE RIVER Melrose (near)	Apr-Sept	710	99	300	718
		Apr-July	704	99	280	669
0330	BOULDER RIVER Boulder (near)	Apr-Sept	86.0	113	53.2	76.3
		Apr-July	82.6	113	51.6	73.0
0345	JEFFERSON RIVER Sappington (at)(12)	Apr-Sept	1050	108	331	974
		Apr-July	945	108	304	875
0375	MADISON RIVER West Yellowstone (near)	Apr-Sept	235	113	195	208
		Apr-July	177	113	145	157
0385	MADISON RIVER Grayling (near)(13)	Apr-Sept	484	115	378	420
		Apr-July	380	115	287	330
0410	MADISON RIVER McAllister (near)(14)	Apr-Sept	818	114	620	718
		Apr-July	656	114	477	576
0435	GALLATIN RIVER Gateway (near)	Apr-Sept	570	127	389	447
		Apr-July	484	127	329	381
0485	BRIDGER CREEK Bozeman (near)	Apr-Sept	26.5	133	17.6	19.9
		Apr-July	24.9	133	16.6	18.7
0500	HYALITE CREEK Bozeman (near)(15)	Apr-Sept	47.5	133		35.6
		Apr-July	41.0	133		30.8
0525	GALLATIN RIVER Logan (at)	Apr-Sept	620	133	320	467
		Apr-July	527	133	262	396

- (11) Adjusted for storage in Lima Reservoir.
- (12) Adjusted for storage in Clark Canyon Reservoir.
- (13) Adjusted for storage in Hebgen Lake.
- (14) Adjusted for storage in Hebgen and Ennis Lakes.
- (15) Adjusted for storage in Middle Creek Reservoir.

27263000 / 27263000

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Figure 1. Schematic diagram of the pump assembly.

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WATER SUPPLY FORECASTS

AS OF MARCH 1, 1967

NO.	RIVER AND FORECAST POINT	FORECAST PERIOD	FORECAST THIS YEAR	PERCENT AVERAGE	(1000 Acre Feet) MEASURED FLOW	
					LAST YEAR*	AVERAGE
0545	MISSOURI RIVER Toston (at)(16)	Apr-Sept	2380	111	1119	2147
		Apr-July	2070	111	966	1861
0615	PRICKLY PEAR CREEK Clancy (near)	Apr-Sept	25.5	116		22.0
		Apr-July	22.2	116		19.2
0770	SHEEP CREEK White Sul. Spgs. (near)	Apr-Sept	22.3	135	19.1	16.5
		Apr-July	19.2	135	16.4	14.2
0786	SUN RIVER Gibson Dam (at)(17)	Apr-Sept	745	122	450	610
		Apr-July	683	122	412	559
0908	MISSOURI RIVER Fort Benton (at)(18)	Apr-Sept	3805	113		3319
		Apr-July	3190	113		2825
0920	TWO MEDICINE CREEK Browning (near)(19)	Apr-Sept	310	114		271
		Apr-July	197	114		260
0925	BADGER CREEK Browning (near)	Apr-Sept	166	116		143
		Apr-July	144	116		124
0990	CUT BANK CREEK Cut Bank (at)	Apr-Sept	150	106	89.2	142
		Apr-July	139	106	82.0	131
0995	MARIAS RIVER Shelby (near)(20)	Apr-Sept	710	109	435	651
		Apr-July	672	109	407	617
1095	MISSOURI RIVER Virgelle (at)(21)	Apr-Sept	4630	112		4116
		Apr-July	4000	112		3557
1100	JUDITH RIVER Utica (near)	Apr-Sept	43.5	130		33.5
		Apr-July	40.5	130		31.1
1150	MISSOURI RIVER Zortman (near)(21)	Apr-Sept	5100	113		4508
		Apr-July	4390	113		3878
1155	NORTH FORK MUSSELSHELL R. Delpine (near)	Apr-Sept	7.7	128	4.0	6.0
		Apr-July	6.4	128	3.5	5.0
1185	SOUTH FORK MUSSELSHELL R. Martinsdale (above)	Apr-Sept	58.0	119	44.2	48.8
		Apr-July	55.3	119	42.6	46.6

- (16) Adjusted for storage in Hebgen and Ennis Lakes and Clark Canyon Reservoir.
 (17) Adjusted for storage in Gibson Reservoir and diversions.
 (18) Adjusted for storage in Canyon Ferry Reservoir.
 (19) Adjusted for storage in Two Medicine Res. & diversions into Two Medicine Canal.
 (20) Adjusted for storage in Two Medicine, Four Horns, Lake Frances & Swift Res.
 (21) Adjusted for storage in Canyon Ferry and Tiber Reservoirs.

STANDARD FORM NO. 64

(Rev. 1-15-60)

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1. IDENTIFICATION					2. DESCRIPTION	
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APPROVED: _____ SPECIAL AGENT IN CHARGE	DATE: _____ OFFICE: _____
PREPARED BY: _____ SPECIAL AGENT	
REVIEWED BY: _____ SUPERVISOR	

WATER SUPPLY FORECASTS

AS OF MARCH 1, 1967

					(1000 Acre Feet)	
NO.	RIVER AND FORECAST POINT	FORECAST PERIOD	FORECAST THIS YEAR	PERCENT AVERAGE	MEASURED FLOW	
					LAST YEAR*	AVERAGE
	MISSOURI RIVER					
1320	Ft. Peck Dam (below)(22)	Apr-Sept	4900	111		4422
		Apr-July	4300	111		3894
	MILK RIVER					
1350	Eastern Crossing (at)	Mar-Sept	253	93	284	272
	MISSOURI RIVER					
1770	Wolf Point (near)(22)	Apr-Sept	5250	107		4879
		Apr- July	4640	107		4317
	MISSOURI RIVER					
3300	Williston, N.D.(nr.)(29)	Apr-Sept	12000	109		11059
		Apr-July	10700	109		9828

SASKATCHEWAN RIVER BASIN

ST. MARY RIVER						
0175	Babb (near)(30)	Apr-Sept	610	124		491
		Apr-July	527	124		424

- (22) Adjusted for storage in Canyon Ferry, Tiber and Fort Peck Reservoirs.
 (29) Adjusted for storage in Canyon Ferry, Tiber, Fort Peck, Buffalo Bill, Boysen and Yellowtail Reservoirs.
 (30) Adjusted for storage in Lake Sherburne.

WATER SUPPLY FORECASTS

AS OF MARCH 1, 1967

(1000 Acre Feet)

NO.	RIVER AND FORECAST POINT	FORECAST PERIOD	FORECAST THIS YEAR	PERCENT AVERAGE	MEASURED FLOW	
					LAST YEAR*	AVERAGE

YELLOWSTONE RIVER BASIN

YELLOWSTONE RIVER						
1915	Corwin Springs (at)	Apr-Sept	2120	113	1494	1877
		Apr-July	1780	113	1250	1572
YELLOWSTONE RIVER						
1925	Livingston (near)	Apr-Sept	2400	113	1628	2127
		Apr-July	2000	113	1354	1770
SHIELDS RIVER						
1935	Clyde Park (at)	Apr-Sept	112	113		99.0
		Apr-July	104	113		92.2
BOULDER RIVER						
2000	Big Timber (at)	Apr-Sept	415	121	229	343
		Apr-July	389	121	220	321
STILLWATER RIVER						
2050	Absarokee (near)(25)	Apr-Sept	670	121		552
		Apr-July	565	121		465
CLARKS FORK RIVER						
2075	Chance (at)	Apr-Sept	655	112	431	583
		Apr-July	582	112	389	528
CLARKS FORK RIVER						
2085	Edgar (at)	Apr-Sept	675	111	430	609
		Apr-July	597	111	379	538
ROCK CREEK						
2095	Red Lodge (near)	Apr-Sept	128	124	91.4	103
		Apr-July	99	124	69.1	79.6
YELLOWSTONE RIVER						
2145	Billings (at)	Apr-Sept	4500	115	2938	3913
		Apr-July	3870	115	2516	3362
BIG HORN RIVER						
2870	St. Xavier (near)(26)	Apr-Sept	1700	101		1677
		Apr-July	1590	101		1568
YELLOWSTONE RIVER						
3090	Miles City (at)(27)	Apr-Sept	6400	110		5778
		Apr-July	5620	110		5080
YELLOWSTONE RIVER						
3295	Sidney (near)(27)	Apr-Sept	6430	110		5850
		Apr-July	5750	110		5230

(25) Adjusted for storage in Mystic Lake.

(26) Adjusted for storage in Buffalo Bill, Boysen, Bull Lake and Yellowtail Reservoirs.

(27) Adjusted for storage in Buffalo Bill, Boysen and Yellowtail Reservoirs.

1. The first part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

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51.	52.	53.	54.	55.	56.	57.	58.	59.	60.
61.	62.	63.	64.	65.	66.	67.	68.	69.	70.
71.	72.	73.	74.	75.	76.	77.	78.	79.	80.
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SNOW SURVEY DATA

AS OF MARCH 1, 1967

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

COLUMBIA RIVER BASIN

KOOTENAI RIVER

15B11	Baree Creek	5500	3/1	134	54.8	38.5	-
15B16	Baree Midway	4600	2/28	110	44.4	30.9	-
15B15	Baree Trail	3800	2/28	27	8.4	11.2	-
14A04	Brush Creek	5000	3/1	40	13.2	11.7	12.7*
BC 10	Fernie	3500	2/27	28	8.3	10.0	9.0
BC 12A	Field	4200	2/28	69	7.5	5.1	5.8
BC 11	Glacier	4100	2/26	100	37.5	28.0	24.0*
14A11	Graves Creek	4300	2/28	66	23.5	15.3	-
BC 43	Gray Creek	5100	2/26	67	16.7	15.4	16.7*
BC 33	Kicking Horse	5400	2/28	53	16.3	13.0E	13.3
BC 20B	Kimberley	3800	2/26	24	6.9	8.8	8.4
BC 32	Marble Canyon	5000	2/28	54	17.5	16.3	13.5
BC 10B	Morrissey Ridge	6100	3/1	96	38.0	27.5	-
BC 10A	New Fernie	4100	2/27	55	18.1	15.3	13.2*
15A01	Red Mountain	6000	2/27	60	23.9	17.8	18.0
BC 8A	Sinclair Pass	4500	2/28	28	8.4	6.6	5.8*
BC 20A	Sullivan Mine	5100	2/27	44	14.1	12.5	13.4
BC 41	Upper Elk River	4400	2/26	25	10.5	6.5	7.9
14A07	Weasel Divide	5450	2/28	111	44.4	28.3	30.4*

FLATHEAD RIVER

14B03	Bassoo Peak	5150	2/27	34	11.2	10.8	11.1*
13A11	Beaver Lake	5900	3/5	71	25.2	17.5	-
13B03	Big Creek	6750	3/1	118	48.4	30.8	38.5
13A17	Camp Misery	6400	3/3	137	59.7	35.2	33.0*
13A02	Desert Mountain	5600	3/2	49	17.8	12.5	14.1*
13B04	Fatty Creek	5500	3/1	73	26.2	17.2	18.0*
14A09	Griffin Creek Divide	5150	2/28	42	13.3	9.8	12.4*
13B12	Gunsight Lake	6300	3/5	129	51.8	32.5	-
14A03	Hell Roaring Divide	5770	3/3	94	38.7	25.8	26.8*
13B13	Holbrook	4530	2/27	40	12.9	7.9	10.2*
14A06	Kishenehn	3890	2/28	36	9.8	8.8	9.9
14A05	Logan Creek	4300	3/6	33	7.9	8.0	8.8*
13A05	Marias Pass	5250	2/23	67	21.3	15.8	17.3
13A16	Mineral Creek	4000	2/25	70	23.0	17.8	19.8
13B07	North Fork Jocko	6330	3/2	132	49.8	33.8	39.8
13B02	Spotted Bear Mountain	7000	2/27	54	19.3	13.7	14.6
13B01	Trinkus Lake	6100	2/27	128	48.1	32.6	36.3*
13B11	Twin Creeks	3580	2/27	43	14.6	12.6	12.4*
13B05	Upper Holland Lake	7000	2/27	114	39.5	26.5	29.8*

E - Estimated

NOTE: ALL AVERAGES BASED ON 1948-1962 (15 YEAR PERIOD). *ADJUSTED AVERAGE



SNOW SURVEY DATA

AS OF MARCH 1, 1967

SNOW COURSE			CURRENT DATA			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE
NO.	NAME	ELEVATION					

(inches)

CLARK FORK RIVER

13C13	Black Pine	7100	2/28	43	14.8	9.3	11.3*
13C13	Black Pine Pillow	7100	2/28	SP	13.8	9.1	-
12B10	Copper Creek	5700	3/3	57	20.0	12.4	-
12B11	Cotter Mine	6250	3/3	65	22.4	13.1	-
13B10	Coyote Hill	4200	3/2	38	12.0	8.4	10.2
13C09	El Dorado Mine	7800	3/3	64	19.2	10.8	17.6*
13C11	Fred Burr Pass	8000	2/28	69	24.7	15.4	23.8*
13C10	Gold Creek Lake	7200	3/3	49	14.3	8.6	13.4*
14C10	Heart Lake Trail	4800	3/2	73	22.0	21.4	-
15C10	Hoodoo Basin	6000	3/2	137	47.3	-	-
15C10	Hoodoo Basin Pillow	6000	2/27	SP	45.5	-	-
15C01	Hoodoo Creek	5900	3/2	132	46.1	34.6	45.3*
13C04	Intergaard	6450	3/1	30	8.6	5.7	7.2
15B02	Lookout	5250	3/1	103	35.6	27.1	34.8*
13C21	Lubrecht Forest No. 3	5450	2/26	26	7.0	6.9	7.4*
13C22	Lubrecht Forest No. 4	4650	2/26	11	3.0	3.6	3.9*
13C08	Lubrecht Forest No. 6	4040	2/26	13	3.8	3.8	4.6*
13C12	Red Lion	7100	2/28	46	15.0	10.0	13.8*
13C03	Skalkaho Summit	7260	3/2	77	27.2	17.2	22.5*
13C02	Slide Rock Mountain	7100	3/1	40	12.6	10.0	12.6*
13C05	Southern Cross	6500	3/1	27	8.3	5.4	5.6
13C18	Spring Gulch	6000	2/25	38	10.7	10.3	10.5*
13C07	Storm Lake	7780	2/27	42	12.5	7.6	11.7*
13C06	Stuart Mill	6500	3/1	26	7.2	4.8	5.9
13C01	Stuart Mountain	7400	2/25	85	31.2	25.1	26.5*
14B01	TV Mountain	6800	2/24	51	16.0	15.4	14.9*

BITTERROOT RIVER

13C16	Ambrose	6480	2/26	43	12.9	10.2	12.1*
13D01	East Fork R.S.	5400	2/26	24	6.5	4.5	7.1*
13D02	Gibbons Pass	7100	2/22	66	21.2	12.6	21.0
14C05	Lolo Pass	5230	2/24	93	31.3	20.2	32.2*
14C07	Lost Horse	5940	2/28	89	31.6	20.0	30.3*
13D16	Moose Creek	6200	3/1	48	16.0	10.6	14.9
14D02	Nez Perce Camp	5680	2/27	50	16.5	9.2	12.8*
14D01	Nez Perce Pass	6570	2/27	50	16.8	10.4	14.8*
13D22	Saddle Mountain	7940	2/27	69	24.2	13.4	-
14C04	Savage Pass	6600	2/24	76	26.0	21.2	25.0*
14C08	Twin Lakes	6510	2/28	110	39.8	26.6	39.5*

SP -

Snow pillow observation - water content only.

NOTE: ALL AVERAGES BASED ON 1948-1962 (15 YEAR PERIOD). *ADJUSTED AVERAGE

SNOW SURVEY DATA

AS OF MARCH 1, 1967

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

MISSOURI RIVER BASIN

BEAVERHEAD RIVER

13D10	Bloody Dick	7600	2/28	35	10.6	6.2	9.6
12E03	Camp Creek	6800	2/27	34	10.0	6.8	8.7
12D04	Carter Creek	7400	No measurement			2.5	-
13E22	Dad Creek Lake	8400	2/23	44	12.1	-	-
13D15	Elk Horn Springs	7800	2/27	30	8.1	5.9	8.8
13D09	Gold Stone	8100	2/28	44	13.8	8.2	12.4
11E12	Kilgore	6200	2/26	33	10.0	8.2	8.8
11E04	Lakeview Canyon	6930	2/28	40	13.0	9.4	9.6
11E03	Lakeview Ridge	7400	2/28	37	11.8	7.7	8.1
13E01	Lemhi Pass	7480	2/27	29	7.2	5.4	7.1
13E23	Lemhi Ridge	8100	2/27	31	8.0	-	-
13E02	Trail Creek	7090	2/27	29	7.1	4.6	6.4
12E01	White Pine Ridge	8850	2/23	18	3.4	3.7	4.4

RUBY RIVER

11D08	Clover Meadow	8600	2/23	49	14.0	11.0	-
12E07	Divide	7900	2/23	37	9.8	7.0	-
12E06	Notch	8500	2/23	42	11.9	12.1	-

BIG HOLE RIVER

13D20	Abundance Lake	8800	2/23	56	17.0	13.6	-
13D19	Darkhorse Lake	8600	2/23	68	23.8	16.4	-
13D21	Foolhen	8280	2/23	50	15.4	10.7	-
13D08	Jahnke Creek	7340	2/28	32	8.9	5.5	8.8

JEFFERSON RIVER

12C07	Berry Meadow	7300	3/3	34	9.0	5.1	6.5*
12C09	Copper Mountain	7700	2/28	35	10.3	-	-
12C10	Nez Perce Creek	6500	2/28	26	7.2	-	-
12C06	Picnic Grounds	6500	2/28	20	5.0	2.6	4.2*
12D01	Pipestone Pass	7200	3/1	19	5.0	3.6	4.5

MADISON RIVER

11E09	Big Springs	6500	2/27	68	23.1	13.9	19.6
11D07	Call Road	8050	2/23	37	10.0	7.4	-
11D12	Four Mile	6900	3/2	26	6.8	5.3	-
11E25	Freezeout Lake	7200	2/23	36	9.8	-	-
11E26	Freezeout Mountain	8250	2/23	56	17.0	-	-
11E05	Hebgen Dam	6550	2/25	39	12.3	6.7	10.8
11E10	Island Park	6315	2/27	54	17.2	11.2	15.3
11D05	Jack Creek	7500	3/1	20	5.0	3.0	5.0*

NOTE: ALL AVERAGES BASED ON 1948-1962 (15 YEAR PERIOD). *ADJUSTED AVERAGE

SNOW SURVEY DATA

AS OF MARCH 1, 1967

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

MADISON RIVER - (continued)

11E22	Lake Creek	6100	2/23	29	8.4	-	-
11E28	Lion Mountain Pillow	8760	2/20	SP	14.5	-	-
11D11	Lower Twin	7900	3/2	51	16.6	13.6	-
11E23	Meridian Creek	7000	2/24	33	8.8	-	-
10E02	Norris Basin	7500	3/1	41	12.4	7.1	9.0*
11D03	North Meadow	7500	3/2	26	6.8	4.9	7.3*
11E21	Potomageton Park	7150	2/24	51	16.1	9.5	-
11E20	Sentinel Creek	8300	2/24	78	26.1	15.4	-
11E24	Tepsee Creek	8000	2/24	46	14.1	-	-
11E27	Upper West Fork	8750	2/20	50	14.4	-	-
11E08	Valley View	6500	2/27	61	22.2	10.6	13.2
11E07	West Yellowstone	6700	2/26	47	14.7	7.0	10.6
11E07	West Yellowstone Pillow	6700	2/28	SP	10.9	-	-

GALLATIN RIVER

10D14	Arch Falls	7350	2/27	42	12.2	6.4	9.5*
11D09	Bear Basin	8150	3/2	61	19.7	12.0	16.3*
10D15	Bridger Bowl Pillow	7250	2/28	SP	20.4	16.2	-
11E29	Carrot Basin Pillow	9000	2/20	SP	29.8	-	-
10D04	Devil's Slide	8100	2/27	67	21.4	12.2	17.4
10D03	Hood Meadow	6600	2/27	33	9.8	4.6	7.6
10D13	Lick Creek Pillow	6860	2/28	SP	11.2	5.5	-
11D10	Little Park	7400	3/2	50	15.6	8.5	11.4*
10D18	Maynard Creek Pillow	6210	2/28	SP	11.4	-	-
10D01	New World	6700	2/25	39	11.9	5.6	8.6
10D16	Shower Falls Pillow	8100	2/27	SP	22.0	14.6	-
11D13	Taylor Peaks Pillow	8500	2/23	SP	18.0	-	-
11E06	Twenty-One Mile	7150	2/26	60	21.5	12.7	15.8

MISSOURI RIVER (Main Stem)

11C01	Boulder Mountain	7950	2/27	55	17.8	12.2	12.5*
12C05	Chessman Reservoir	6200	2/28	16	4.5	2.2	4.0
10C09	Deadman Creek	6450	3/1	42	14.0	8.7	-
10C07	Elk Peak	8000	2/28	54	18.8	11.2	13.3*
10C02	Grasshopper	7000	2/28	16	4.2	4.0	4.3
10C01	Kings Hill	7500	2/27	53	16.0	7.8	11.0
9A01	Rocky Boy	5200	2/25	23	6.6	3.0	4.2
12C01	Stemple Pass	6600	2/27	43	12.6	7.1	9.2
12C02	Ten Mile Lower	6600	2/28	27	7.3	3.8	6.3
12C03	Ten Mile Middle	6800	2/27	36	10.3	6.1	9.1
12C04	Ten Mile Upper	8000	2/27	43	12.8	7.6	11.7

SP - Snow pillow observation - water content only.

NOTE: ALL AVERAGES BASED ON 1948-1962 (15 YEAR PERIOD). *ADJUSTED AVERAGE

SNOW SURVEY DATA

AS OF MARCH 1, 1967

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

SUN-TETON-MARIAS RIVERS

13A15	Badger Pass	6900	3/5	110	42.5	28.7	-
12B06	Cabin Creek	5200	3/5	33	12.4	6.6	6.8*
12B09	Five-Bull	5700	3/5	29	9.2	6.1	6.1*
12A01	Freight Creek	6000	3/5	53	18.8	13.2	14.5
12B07	Goat Mountain	7000	2/28	40	12.0	9.9	10.6
12B04	Wrong Creek	5700	3/5	52	20.0	13.3	14.5*
12B03	Wrong Ridge	6800	3/5	66	25.7	18.5	19.6*

JUDITH RIVER

9C02	Avalanche	7100	3/2	75	24.0	-	-
9C01	Crystal Lake	6100	3/1	47	14.4	8.1	10.5
9C03	Rock Creek	5600	3/2	35	10.1	-	-
10C06	Spur Park	8000	3/1	67	22.8	14.7	16.0*
10C06	Spur Park Pillow	8000	3/1	SP	24.9	-	-

MILK RIVER

10AA2	Cress Day B	3450	2/25	11	2.6	2.3	1.3*
9AA1	Cypress Park C	4000	2/27	21	5.3	4.2	4.1*
10AA1	Elkwater Lake A	4100	2/25	12	2.8	1.8	2.0*
7AA1	Val Marie D	2700	2/27	11	2.4	1.9	1.1*

ST. MARY RIVER

13A18	Hudson Bay Divide	5800	2/28	58	20.9	15.1	-
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SASKATCHEWAN (BOW) RIVER

Alb. 1	Bow River	5100	2/22	41	13.8	-	-
Alb. 2	North Course	5400	2/22	43	14.5	-	-
Alb. 5	Lake Louise	5800	2/23	45	14.8	-	-
Alb. 6	Mirror Lake	6600	2/23	50	16.2	-	-
Alb. 8	Misc. Lake Louise	5700	2/23	44	14.1	-	-
Alb. 10	Mount Eisenhower	5000	2/22	28	6.8	-	-

SP - Snow pillow observation - water content only.

NOTE: ALL AVERAGES BASED ON 1948-1962 (15 YEAR PERIOD). *ADJUSTED AVERAGE

SNOW SURVEY DATA

AS OF MARCH 1, 1967

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

UPPER YELLOWSTONE RIVER

10C05	Bald Ridge	7500	3/1	34	10.6	7.4	9.2*
9D01	Camp Senia	7890	3/3	34	7.6	2.1	4.8*
10E03	Canyon	7750	2/26	55	16.8	9.8	13.1
9D07	Cooke Station	8150	3/1	62	20.5	11.6	-
10D05	Crevice Mountain	8400	2/28	37	10.0	6.0	7.5
10E06	East Entrance	7000	2/27	34	9.0	7.3	10.4*
9D06	Fisher Creek	9100	3/1	106	39.8	25.3	-
9D06	Fisher Creek Pillow	9100	3/1	SP	37.8	-	-
9D05	Grizzly Peak	8400	3/1	57	14.6	6.6	10.1*
10D06	Independence	8000	2/24	65	22.7	11.2	15.6*
10E04	Lake Camp	7850	2/28	40	11.2	5.5	9.0
9E01	Lodgepole	8200	3/1	39	11.4	5.5	8.6*
10E06	Lupine Creek	7300	3/3	44	13.5	7.5	9.5
10D12	Monument Peak	9000	2/24	84	29.2	15.2	18.1*
10D07	Northeast Entrance	7400	3/6	39	11.0	5.0	7.5
10D07	Northeast Entrance Pillow	7350	3/6	SP	10.2	-	-
10C03	Porcupine R.S.	6500	3/1	22	6.2	4.5	6.3
10D10	Sacajawea	6550	2/28	38	13.4	9.0	11.1*
10C08	South Fork Shields	8100	3/1	63	23.4	16.1	-
10E05	Sylvan Pass	7100	2/27	48	12.0	8.7	12.6
10E07	Thumb Divide	7900	2/28	66	22.3	17.1	20.0
9D04	Timberline Creek	8850	3/3	60	17.8	6.8	10.9*
9D02	West Rosebud	7500	2/28	44	15.0	-	-
9D08	White Mill	8700	3/1	82	29.5	-	-

SP - Snow pillow observation - water content only.

NOTE: ALL AVERAGES BASED ON 1948-1962 (15 YEAR PERIOD). *ADJUSTED AVERAGE

STATION SURVEY DATA

Form No. 100-100-100

Project Name		Sheet No.		Date	
100-100-100		100-100-100		100-100-100	

100-100-100

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100-100-100

100-100-100

100-100-100

100-100-100

SOIL MOISTURE DATA

AS OF MARCH 1, 1967

(Inches)

SOIL MOISTURE STATION			SOIL PROFILE		CURRENT DATA		PAST RECORD	
NO.	NAME	ELEVATION	DEPTH	FIELD CAPACITY	DATE OF SURVEY	SOIL MOISTURE	LAST YEAR	**AVERAGE

COLUMBIA RIVER BASIN

Kootenai

15B15M	Baree Trail	3800	48	7.5	2/28	6.4	6.3	-
14A10M	Murphy Lake R.S.	3000	48	22.6	3/1	20.8	19.5	-
15A02M	Raven R.S.	3050	48	23.0	3/2	22.2	21.8	-

Flathead

13A02M	Desert Mountain	5600	54	8.4	3/2	8.0	2.3	7.1
13A05M	Marias Pass	5250	54	6.5	2/28	5.5	5.3	5.3

Clark Fork

13C13M	Black Pine	7100	48	10.0	2/28	8.0	5.2	-
13C15M	Georgetown Lake	6450	48	9.0	2/27	5.4	3.6	3.0
13B19M	Seeley Lake R.S.	4030	48	11.9			9.9	-
13C03M	Skalkaho Summit	7260	48	10.8	3/3	9.9	10.0	-

Bitterroot

13D18M	Gibbons Pass	7100	48	7.1	2/27	4.8	5.0	5.4
14C05M	Lolo Pass	5250	48	10.6	2/26	3.8	6.2	6.3

MISSOURI RIVER BASIN

Beaverhead

11E13M	Lakeview	6700	48	15.3	2/28	6.5	6.0	8.9
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Madison

10D04M	Red Bluff	4800	40	4.7	3/1	2.5	2.4	2.3
11E07M	West Yellowstone	6700	48	6.5	2/28	2.5	-	-

Gallatin

10D15M	Bridger Bowl	7250	48	15.8	2/28	15.9	15.7	-
11D02M	College Site	4856	54	14.5	2/24	12.5	13.5	9.7
10D13M	Lick Creek	6860	48	18.8	2/28	18.6	12.0	-
11E06M	Twenty-One Mile	7150	48	10.0	2/28	2.5	3.0	2.8

Missouri Main Stem

10C01M	Kings Hill	7420	48	11.8	3/1	4.9	8.8	8.1
12C08M	Stemple Pass	6350	48	5.9	3/1	4.0	4.4	4.2

Yellowstone

10D11M	Battle Ridge	6020	48	17.6	3/1	12.9	13.0	12.9
10D07M	Northeast Entrance	7350	48	9.4			7.5	7.1

**AVERAGE FOR PERIOD OF RECORD

RESERVOIR STORAGE DATA

AS OF FEBRUARY 28, 1967

(1000 Acre Feet)

			USEABLE STORAGE		
BASIN	RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	AVERAGE
COLUMBIA RIVER BASIN					
Flathead	Hungry Horse	3,428.0	1,746.0	2,272.0	2,436.3**
	Flathead Lake	1,791.0	1,049.0	918.3	845.1
	Camas (Sum of 4)	45.2	26.0	28.8	32.2
	Mission Valley (Sum of 8)	100.3	25.1	60.1	34.5
Clark Fork	Georgetown Lake	31.0	20.0	26.8	23.2
	Noxon Rapids	334.6	267.0	308.3	-
Bitterroot	Como	34.9	10.0	14.6	11.8
	Painted Rocks	31.7	15.1	16.9	13.5**
MISSOURI RIVER BASIN					
Beaverhead	Clark Canyon	328.9	107.9	151.1	-
	Lima	84.0	14.0	45.9	26.1
Ruby	Ruby	38.8	-	-	23.0**
Madison	Hebgen Lake	377.5	170.4	222.3	179.1
	Ennis Lake	41.0	39.7	38.6	37.3
Gallatin	Middle Creek	8.0	3.0	1.8	3.6**
Missouri	Canyon Ferry	2,043.0	1,166.0	1,551.0	1,514.9**
	Hauser & Helena	61.9	61.9	62.4	53.9
	Lake Helena	10.4	10.4	10.7	7.8
	Holter Lake	81.9	81.1	81.7	50.7
	Smith River	10.7	5.6	7.4	5.6**
	Ackley Lake	5.8	-	-	3.5
	Durand	7.0	4.4	5.4	4.2**
	Martinsdale	23.1	74.1	11.8	8.0**
	Deadman's Basin	72.2	41.0	67.4	39.8**
	Fort Peck	19,410.0	15,460.0	16,700.0	10,595.1
Sun	Gibson	105.0	21.9	50.8	58.5
	Willow Creek	32.3	16.4	23.8	19.6
	Pishkun	32.0	16.0	18.8	18.4
Marias	Lower Two Medicine	-	-	-	0.0
	Four Horns	19.2	11.8	12.0	10.5
	Swift	-	-	-	22.0
	Lake Frances	112.0	-	93.8	91.8
Milk	Tiber	1,347.0	471.1	663.3	629.4**
	Fresno	127.2	84.4	81.5	58.6
	Nelson	66.8	49.0	48.7	35.4
	Lake Sherburne	66.1	19.7	12.9	21.6
Yellowstone	Mystic Lake	20.8	7.7	10.5	7.8
	Tongue River	68.0	-	34.3	13.1
	Cooney	27.5	15.8	17.9	11.1**
Big Horn	Yellowtail	1,356.0	651.6	202.1	-

NOTE: ALL AVERAGES BASED ON 1948-1962 (15 YEAR PERIOD). -25- **AVERAGE FOR PERIOD OF RECORD

Agencies Cooperating in Collecting Data Contained in this Bulletin

U. S. Forest Service
Region 1, Missoula, Montana

U. S. Geological Survey
Helena, Montana

U. S. Army Corps of Engineers
Portland, Oregon
Seattle, Washington
Omaha, Nebraska

U. S. Indian Irrigation Service
St. Ignatius, Montana

U. S. Weather Bureau
Helena, Montana

U. S. Bureau of Sports Fisheries
and Wildlife
Red Rock Lakes Refuge
Mojave, Montana

U. S. Bureau of Reclamation
Billings, Montana
Boise, Idaho

U. S. Soil Conservation Service
Montana, Wyoming, Idaho

Soil and Water Conservation Districts
Montana Counties

U. S. Bonneville Power Administration
Portland, Oregon

U. S. National Park Service
Yellowstone National Park
Glacier National Park

Montana Power Company
Butte, Montana

State Water Conservation Board
Helena, Montana

North Montana Branch Station
Agricultural Experiment Station
Havre, Montana

Montana State University
Agricultural Experiment Station
Bozeman, Montana

University of Montana
School of Forestry
Missoula, Montana

Johnson Flying Service, Inc.
Missoula, Montana

Water Rights Branch, Dept. of
Lands and Forests
Victoria, British Columbia

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with the Snow Survey"*